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followed the nucleus in the oogonium of *Cystosira* from the young resting stage to synapsis, metaphase of the first division, and second and third divisions. The number of chromosomes in the first division he reports to be 18-20. He compares the figures of the first division with those of vegetative divisions, and because of the appearance of a much higher number of chromosomes in the vegetative figures, he infers that 18-20 is the reduced number. Further, upon comparison with the case of *Fucus*, he infers that the oogonium of *Cystosira* and *Sargassum* may represent the *x*-generation. The development of the sporelings of *Sargassum* is discussed in comparison with SIMONS' work on another species of the same genus. The reviewer thinks that it is very desirable to have more detailed accounts of the events occurring in the oogonium of these forms and of the processes connected with the development of a normally fertilized or a parthenogenetic egg.—S. YAMANOUCHI.

Spermatogenesis in liverworts.—WOODBURN,²³ while studying spermatogenesis in *Porella*, traversed the work of IKENO, ESCOYEZ, and SCHAFFNER in *Marchantia polymorpha* and that of BOLLETER in *Fegatella conica* for evidences of centrosomes. In none of the forms studied did he find any evidence of centrosomes. Although occasional granules were found in the cytoplasm, or in the region of the spindle, they did not present the appearance of or behave like centrosomes. He concludes that if a body does sometimes occupy the pole of a spindle it does not imply that it is any more a centrosome than the other bodies scattered through the cytoplasm. He says that the blepharoplast develops *de novo* from a dense granular or spherical mass, kinoplasmic in origin, located usually at the most distant angle of the spermatid. The blepharoplast becomes a cord, growing in close contact with the plasma membrane. He thinks the "cytoplasmatischer Fortsatz" of IKENO is merely a part of the blepharoplast. Nothing whatever corresponding to a "Nebenkörper" was found. He concludes that the sperm at maturity represents the two constant cell elements, nucleus and cytoplasm; that the main body of the cell represents the nucleus; that the blepharoplast and cilia represent specialized cytoplasm; and that the remainder of the cytoplasm is found in the vesicle.—W. J. G. LAND.

Records of Oenothera.—GATES²⁴ has undertaken to trace the history of species of *Oenothera* in cultivation, particularly the large-flowered forms. This involved a critical examination of the records through three centuries, beginning with TOURNEFORT'S *Institutiones*. The pertinent evidence is recited from the documents in detail, and the conclusion reached that "a form closely resembling *O. Lamarckiana* was the first *Oenothera* introduced into Europe

²³ WOODBURN, W. L., Spermatogenesis in certain Hepaticae. Ann. Botany 25: 299-313. pl. 1. 1911.

²⁴ GATES, R. R., Early historicobotanical records of the Oenotheras. Proc. Iowa Acad. Sci. 17:85-124. pls. 6. 1910.

from Virginia (about 1614), and therefore that it did not originate in cultivation." Since the writing of the paper, the author has had an opportunity to examine type specimens and early collections in London, and is now inclined to believe that this "first *Oenothera*" was rather the European *O. biennis*, with somewhat large flowers but shorter style. It is of further interest to note in the paper that the author regards *O. Lamarckiana* and all open-pollinated forms as hybrids and not pure races, in the sense that they have undergone crossing in nature as well as in gardens. This means that the important matter to investigate is the relation between this crossing and the phenomena of mutation. At the same time, the author does not believe that there is evidence for regarding *O. Lamarckiana* as an ordinary synthesized hybrid, produced by the crossing of such forms as *O. grandiflora* and *O. biennis*.—J. M. C.

Influence of aspect on vegetation.—From a careful study of the distribution of various plant associations and plant species on the mountain sides of southern Arizona, BLUMER²⁵ states as a general truth that reversion of aspect takes place with change of altitude. Various species of oak and pine furnish much of the evidence upon which this generalization is based, hence the distribution of *Quercus reticulata* upon the Santa Rita Mountains may be cited as an example. It is first found in shaded situations upon north slopes at 6000 feet, and becomes common as a tall clean coppice form at 6500 feet, spreading to the east and west slopes. At 8000 feet it is practically absent from the north side, is abundant on the east and west, and has begun to appear freely on the south side, where it continues as a chaparral growth to an altitude of 9400 feet. A similar change of aspect is exemplified in the occurrence of various other species. The factor concerned in these changes of aspect is the difference in isolation.

The species studied seem to have occupied all the space they are capable of doing, those with the widest range of variations in form and structure having, by virtue of their plasticity, the widest distribution, but even to such forms no extension of range seems possible while the present topography and climate endure.—GEO. D. FULLER.

Orchid bulbs as fungicides.—Small portions cut from the bulbous parts of certain orchids appear to have a toxic effect upon the mycorrhiza of the same plants. In experimental cultures conducted by BERNARD²⁶ they were very fatal to the hyphae of some species of the fungi, destroying all that came in contact with the fluids diffusing from the bulbous material. Certain other species of fungi isolated from orchid roots proved more resistant, fatal effects being evident only in the presence of larger masses cut from the bulbs. Heated

²⁵ BLUMER, J. C., Change of aspect with altitude. *Plant World* 14: 236-248. 1911.

²⁶ BERNARD, NOËL, Sur la fonction fungicide des bulbes d'Ophrydées. *Ann. Sci. Nat. Bot.* IX. 14: 221-234. 1911.